VERMONT ALTERNATE ASSESSMENT

ACHIEVEMENT LEVEL DESCRIPTORS

MATHEMATICS

Achievement Level Descriptors

GRADE 3
MATHEMATICS

		Grade 3 Mathematics Achievement Level Descriptors			
Common Core Standard	Essence Statement	Beginning	Approaching	Meets	Exceeds
CCSS.MATH.CONTENT.3.OA.A.1 Interpret products of whole numbers (e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each). For example, describe a context in which a total number of objects can be expressed as 5 × 7.	Interpret a multiplication expression or product within context.	Use manipulatives or drawings to Identify equal groups.	Use manipulatives, drawings, or symbols to represent repeated addition of single-digit whole numbers (e.g., 2+2+2).	Use manipulatives, drawings, or symbols to represent multiplication facts of two single-digit whole numbers.	Identify a multiplication expression that matches a described scenario.
CCSS.MATH.CONTENT.3.OA.A.2 Interpret whole-number quotients of whole numbers (e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each). For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.	Understand that division is an equal partitioning of a group.	Use manipulatives or drawings to make equal groups. Limit dividend to 10 or less.	Use manipulatives, drawings, or symbols to represent division as repeated subtraction. Limit dividend to 15 or less.	Use manipulatives, drawings, or symbols to determine how many whole number groups a number can be divided into. Limit dividend to 20 or less.	Identify a division expression that matches a described scenario.
CCSS.MATH.CONTENT.3.OA.A.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities. For example, use drawings and equations with a symbol for the unknown number to represent the problem.	Represent and solve multiplication and division word problems involving equal groups, area, and arrays.	Use manipulatives, drawings, or symbols to solve word problems using basic addition and subtraction. Limit sums and differences up to 30.	Use manipulatives, drawings, or symbols to solve multiplication word problems. Limit factors to < 10 and products up to 30.	Use manipulatives, drawings, or symbols to solve multiplication and division word problems. Limit product/dividend to 30 and factors ≤ 10.	Solve word problems involving equal groups, area/array, and number line models using basic multiplication and division. Limit product/dividend to 30 and factors < 10.
CCSS.MATH.CONTENT.3.OA.A.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations 8 × ? = 48, 5 = _ ÷ 3, 6 × 6 = ?	Determine the unknown whole number in an equation.	Using manipulatives, drawings, or symbols, solve for the missing addend in an addition equation.	Using manipulatives, drawings, or symbols, solve for the missing factor in a multiplication equation.	Using manipulatives, drawings, or symbols, solve for the missing minuend in a subtraction equation.	Using manipulatives, drawings, or symbols, solve for the missing divisor in a division equation.
CCSS.MATH.CONTENT.3.OA.B.5 Apply properties of operations as strategies to multiply and divide. Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known (commutative property of multiplication). If 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30 (associative property of multiplication). Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56 (distributive property).	Understand how the properties of operations can be used to multiply numbers.	Given an addition expression represented visually, identify the equivalent expression. Use models limited to the commutative property. For example, 3 + 2 = 2 + 3. Limit to addends up to 4.	Given an addition expression, identify the equivalent expression. Use models limited to the commutative property. For example, 3 + 2 = 2 + 3. Limit to addends up to 4.	Identify equivalent multiplication expressions. Use models limited to the commutative property. Limit to factors up to 4.	Identify equivalent addition or multiplication expressions (without models) limited to the commutative property. Limit to factors up to 4.

CCSS.Math.Content.3.OA.B.6 Understand division as an unknown-factor problem. For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.	Understand the relationship between multiplication and division.	Use manipulatives, drawings, or symbols to identify the related addition expression/ equation given a subtraction expression/ equation.	Identify the related addition expression/ equation given a subtraction expression/equation.	Use manipulatives, drawings, or symbols to identify the related multiplication expression/ equation given a division expression/equation.	Identify the related multiplication expression/ equation given a division expression/equation.
CCSS.Math.Content.3.OA.C.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (i.e., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of grade 3, know from memory all products of two one-digit numbers.	Demonstrate basic multiplication and division facts.	Given a real-life context, manipulatives, drawings, or symbols, represent repeated addition of single-digit whole numbers (limit to single-digit addends and sums within 20 or addends of 10 and sums within 50). Recommend the use of coins or coin visuals (pennies, nickels, dimes, and quarters) as repeated addition entities.	Given a real-life context, manipulatives, drawings, or symbols represent repeated subtraction of single-digit whole numbers to find how many groups of a specified size/amount exist within a set (limit to single-digit minuends and subtrahends within 25 or minuends of 10 and sums within 100). Recommend the use of coins or coin visuals: pennies, nickels, dimes, and quarters and initial subtrahend amounts that are a multiple of one type of coin.	Multiply or divide single-digit whole numbers. Limit to single-digit factors that multiply to 25. Note: Use visual representations of nickels, quarters, dimes, and pennies, along with other variations of visual representations.	Multiply or divide single-digit whole numbers. Limit to single-digit factors that multiply to 50. Note: Use visual representations of nickels, quarters, dimes, and pennies, along with other variations of visual representations.
CCSS.Math.Content.3.OA.D.8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	Model a problem involving any of the four operations.	Given manipulatives or drawings, identify which operation should be used to solve a one-step word problem. Limit to addition/subtraction operations.	Model and solve a one-step word problem. Limit to addition/subtraction operations.	Identify which operation should be used to model and solve a one-step word problem. Limit to multiplication/ division operations.	Model and solve a one-step word problem with any of the four operations.
CCSS.Math.Content.3.OA.D.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.	Identify a rule for an arithmetic pattern.	Use manipulatives to build or Identify the next picture, shape, or symbol in the given pattern.	Use manipulatives, drawings, or symbols to identify a rule or pattern for an addition or subtraction sequence, given at least 3 numbers in the sequence. Limit to addition or subtraction between numbers 1, 2, 5, and 10.	Identify a rule or pattern for an addition or subtraction sequence, given at least 3 numbers in the sequence. Limit to addition or subtraction between numbers 1, 2, 5, and 10.	Identify a rule or pattern for an addition or subtraction sequence. Limit to addition or subtraction between numbers 1 to 10.
CCSS.Math.Content.3.NBT.A.1 Use place value understanding to round whole numbers to the nearest 10 or 100.	Apply place value understanding to round whole numbers to the nearest 10. Limit to whole numbers 1 to 100.	Given a visually displayed whole number between 0 and 10, determine if the number is closer to 0 or 10.	Using a visual model (e.g., number line), determine which ten a number is closer to, or if it is closer to 0. Limit to whole numbers 0 to 50.	Using a visual model (e.g. number line) or symbols to round whole numbers to the nearest 10 within 100.	Use place value understanding to round whole numbers to the nearest 10 within 100.

CCSS.Math.Content.3.NBT.A.2 Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.	Add and subtract numbers within 100.	Using manipulatives and visual models, given an addition expression, identify an equivalent addition expression that represents it by decomposing the original addition expression. For example, 29 + 13 = 20 + 9 + 10 + 3.	Using manipulatives and visual models, add two double-digit numbers that are within 100 and limited to a problem that has no regrouping.	Using manipulatives and visual models, add and subtract two double-digit numbers that are within 100 and limited to a problem that has no regrouping.	Using manipulatives and visual models, add and subtract within 100 with regrouping.
CCSS.Math.Content.3.NBT.A.3 Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.	Multiply single-digit numbers by multiples of 10.	Use manipulatives, drawings, or symbols to identify multiples (groups) of 10.	Use manipulatives (e.g., dimes), drawings, or symbols to multiply single-digit (limit single digit up to 5) numbers by multiples of 10 in the range of 10–40.	Multiply single-digit numbers (limit single digit up to 5) by multiples of 10 in the range of 10-50.	Multiply single-digit numbers by multiples of 10 in the range of 10 - 100.
CCSS.Math.Content.3.NF.A.1 Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts. Understand a fraction a/b as the quantity formed by a part of size 1/b.	Recognize that fractions represent parts of a whole.	Determine how many equal parts there are in a given model. Limit to circles, squares, rectangles.	Use manipulatives or drawings that represent a fraction to determine the number of parts (numerator) that represent the whole (denominator), represented by the model.	Use manipulatives, drawings, or symbols that represent a fraction to determine the number of parts of the whole that are being considered (numerator) and/or the number of parts that make up the whole (denominator), represented by the model.	Identify the fraction represented by the model. Limit numerators to the numbers 2, 3, 4. Limit denominators to halves, thirds, fourths (i.e., no fractions greater than 1).
CCSS.Math.Content.3.NF.A.2a Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size 1/b and that the endpoint of the part based at 0 locates the number 1/b on the number line.	Identify equal partitioning on a number line to represent fractions.	Identify a number line that shows equal spacing of whole numbers.	Identify equal partitioning on a number line to represent fractions with denominators of 2, 3, and 4.	Match a point shown on a number line with the fraction it represents or select the fraction that is represented on a given number line. Limit to unit fractions with denominators of 2, 3, and 4.	Match a point shown on a number line with the fraction it represents or vice versa. Limit to fractions with denominators of 2, 3, and 4.
CCSS.Math.Content.3.NF.A.3 Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.	Compare fractions represented visually by reasoning about their size.	Use manipulatives and/or drawings to identify the denominator of a fraction.	Use manipulatives and drawings to compare the size of fractions with the same denominator.	Identify the fraction model with the same denominator that is smaller or larger.	Given a fraction, identify a fraction that is smaller, larger, or equal.
CCSS.Math.Content.3.MD.A.1 Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes. For example, represent the problem on a number line diagram.	Identify time intervals using analog clocks.	Match the time on a schedule to the time on a clock to the nearest hour.	Match the time on a schedule to the time on a clock to the nearest hour and half-hour.	Match the time on a schedule to the time on a clock to hour, half-hour, quarter hour.	Match the time on a schedule to the time on a clock to the nearest 5 minutes.

CCSS.Math.Content.3.MD.A.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units. For example, use drawings (such as a beaker with a measurement scale) to represent the problem.	Use addition or subtraction to solve problems involving masses or volumes.	Identify a whole number on a vertical number line up to 10.	Given a visual, determine the volume or mass of an object(s).	Given two objects and their volumes or mass, find the sum or difference of their volumes or mass. Limit to numbers within 20.	Given two objects and their volumes or mass, find the sum or difference of their volumes or mass.
CCSS.Math.Content.3.MD.B.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.	Interpret data from a picture graph or bar graph.	Identify the title or symbols on a picture graph.	Identify the number of objects from a picture graph or a bar graph. Limit to two categories. For a bar graph, limit axis to increments of 1, 2, or 5. Show major gridlines.	Identify the number of objects from a picture graph or a bar graph. Limit to three categories. For a bar graph, limit axis to increments of 1, 2, 5, 10 (up to 50). Show major gridlines.	Interpret data from a picture graph or bar graph (e.g., how many more or how many less). For bar graphs, limit axis to increments of 1, 2, 5, or 10. Major gridlines should be shown for each increment of 1, 2, 5, and 10. Limit increments of 10 to 50. Limit up to three categories.
CCSS.Math.Content.3.MD.B.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot where the horizontal scale is marked off in appropriate units (i.e., whole numbers, halves, or quarters).	Identify measured lengths on line plots.	Identify the length of an object or line segment to the nearest whole unit.	Identify the line plot that shows the given measurement data. Limit to whole numbers.	Identify the length of a line segment to the nearest half inch.	Identify the line plot that shows the given measurement data. Limit to halves.
CCSS.Math.Content.3.MD.C.6 Measure areas by counting unit squares (square cm, square m, square in, square ft., and improvised units).	Understand that the area of a figure can be found by counting the total number of square units that it is composed of.	Identify which method should be used to find the area. For example, how do you find the area of a shape? Weigh it, count the units, etc.	Select the highlighted part of the shape that corresponds to its area given a single shape. For example, highlight inside, outside, one of the sides, etc.	Count unit squares to find the area of a square. Limit to squares with a maximum area of 16.	Count unit squares to find the area of a figure composed of rectangles or squares. Limit to figures with a maximum area of 25.
CCSS.Math.Content.3.MD.C.7d Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real-world problems.	Understand that rectilinear figures can be decomposed into non-overlapping rectangles. The area of a rectilinear figure can be found by adding the areas of the non-overlapping rectangles.	Count unit squares to find the area of a gridded square. Maximum area should be less than or equal to 9.	Count unit squares to find the area of an L or T shape. Maximum area should be less than or equal to 12.	Given untiled interior areas of two rectilinear shapes, calculate the total area. Maximum area should be less than or equal to 16.	Given untiled areas of two rectilinear shapes, calculate the total area. Maximum area should be up to 25.

CCSS.Math.Content.3.MD.D.8 Solve real-world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.	Solve real-world problems involving perimeter.	Identify addition as the operation used to find perimeter.	Given a real-world problem and all side lengths of an equilateral triangle or square, determine the perimeter. Limit side lengths to 1–5 and 10.	Given a real-world problem and the side lengths of a triangle, rectangle, or pentagon, determine the perimeter.	Given a real-world problem and two side lengths of a rectangle or one side of a square, determine the perimeter.
CCSS.Math.Content.3.G.A.1 Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.	Identify shared attributes found between rhombuses, rectangles, and squares.	Identify the number of sides in a given shape. Limit to six sides.	Distinguish between quadrilaterals and non-quadrilaterals.	Identify shared attributes found between rhombuses, rectangles, and squares.	Distinguish between rhombuses, rectangles, and squares.
CCSS.Math.Content.3.G.A.2 Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into four parts with equal area, and describe the area of each part as 1/4 of the area of the shape.	Identify the equally partitioned shape that represents halves or fourths.	Identify the shape that is divided into equal parts.	Select the area model that is divided into halves.	Select the area model that is divided into halves or fourths.	Identify the fraction represented by the shaded part of an area model.

GRADE 4
MATHEMATICS

		GRADE 4 MATHEMATICS Achievement Level Descriptors			
Common Core Standard	Essence Statement	Beginning	Approaching	Meets	Exceeds
CCSS.MATH.CONTENT.4.OA.A.1 Interpret a multiplication equation as a comparison (e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5). Represent verbal statements of multiplicative comparisons as multiplication equations.	Identify multiplicative comparisons.	Use manipulatives, drawings, and symbols to represent repeated addition.	Use manipulatives and/or Identify drawings, and symbols that represent multiplication.	Use manipulatives, drawings and symbols to represent multiplicative comparison.	Identify the equation that represents the given multiplicative comparison (in words).
CCSS.MATH.CONTENT.4.OA.A.2 Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.	Solve word problems involving multiplicative comparison.	Use manipulatives and or Identify visuals that represent “twice as” many objects. Limit size of set to 5 objects.	Use manipulatives and/or Identify visuals that represent “twice as” many objects. Limit size of set to 10 objects.	Solve multiplicative comparison problems involving “twice as” given visuals. Limit to whole numbers with factors up to 10.	Solve multiplicative comparison problems involving “three times as” given visuals. Limit to whole numbers with factors up to 10.
CCSS.MATH.CONTENT.4.OA.A.3 Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	Solve two-step word problems involving the four operations.	Using a visual model or manipulatives, solve one-step addition or subtraction word problems.	Using a visual model or manipulatives Solve one-step addition, subtraction, or multiplication word problems.	Solve a two-step word problem involving addition, subtraction, or multiplication. Solve a one-step division word problem (without remainders).	Solve a one-step word problem involving division that includes interpreting a remainder.
CCSS.MATH.CONTENT.4.OA.B.4 Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.	Identify factor pairs.	Use manipulatives or visual representations to find factor pairs for products within 12.	Use manipulatives or visual representations to find factor pairs for products within 25.	Find factor pairs for a whole number (within 50).	Find factor pairs for a whole number (within 100). Determine whether a number is prime or composite.

CCSS.MATH.CONTENT.4.OA.C.5 Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. For example, given the rule "add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.	Identify a rule that generates a shape or number pattern (vice versa).	Use manipulatives to build or identify the next two, three, or four shapes given a pattern.	Determine the next number in a sequence of numbers with a given rule (given at least 4 numbers in the sequence; limit to addition by: 1, 2, 3, 4, 5, 10, and 100).	Determine the next two or three numbers in sequence of numbers with a given rule (given at least 3 numbers in the sequence; limit to addition or subtraction by: 1, 2, 3, 4, 5, 10, and 100). Note: For patterns where -/+ 10, numbers should be multiples of 10 and patterns where -/+ 100, numbers should be multiples of 100.	Given a number sequence, identify the given rule and continue the sequence (given at least 4 numbers in the sequence; limit to addition or subtraction by: 1, 2, 3, 4, 5, 10, and 100).
CCSS.MATH.CONTENT.4.NBT.A.1 Recognize that in a multi-digit whole number, a digit in one place represents 10 times what it represents in the place to its right. For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.	Determine 10 times as many.	Given a visual that represents a number, select the visual that represents that number times 10. Limit to single digits; whole numbers 5 or less.	Given a visual that represents a number, select the visual that represents that number times 10. Limit to single digits; whole numbers 10 or less.	Given a number and its visual representation, determine which number is 10 times larger than the given number. Limit to single digits; whole numbers 10 and under.	Determine which number is 10 times larger or 10 times smaller than the given number. Limit to factors up to 100.
CCSS.MATH.CONTENT.4.NBT.A.2 Read and write multi-digit whole numbers using base 10 numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	Identify and compare numbers expressed numerically, visually, or in expanded form.	Given base 10 blocks or a place value chart, or expanded form, identify the place value for a single digit within a two-digit number.	Given base 10 blocks or a place value chart or expanded form, representing a three-digit number, identify the relationships between digits and their place value.	Compare two numbers (up to three-digits) represented in expanded form or with or without base 10 blocks using words or symbols (>, <, =).	Compare two numbers using the symbols >, =, <.
CCSS.MATH.CONTENT.4.NBT.A.3 Use place value understanding to round multi-digit whole numbers to any place.	Round multi-digit whole numbers.	Given a number line model for a two-digit number, identify if the number should be rounded up to the next group of 10 or remain in the same group of 10.	Round two-digit whole numbers to the nearest ten.	Round three-digit whole numbers to the nearest hundred.	Round any multi-digit number to the nearest thousand.
CCSS.MATH.CONTENT.4.NBT.B.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.	Add and subtract multi-digit numbers.	Add and subtract single-digit numbers within 10 with novisuals.	Add and subtract whole numbers up to 50.	Add and subtract multi-digit whole numbers within 100	Add and subtract multi-digit whole numbers within 1000.
CCSS.MATH.CONTENT.4.NBT.B.5 Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	Multiply two-digit numbers by one-digit numbers.	Identify grouping and repeated addition to solve multiplication problems (3 groups of 2 make 6, or 2 sets of 4 make 8.)	Identify equivalent addition or multiplication expressions. For example, 5 × 6 is the same as 6 × 5 or 5 +6 is the same as 6 + 5.	Multiply two-digit numbers by one-digit numbers using rectangular arrays or area models. Limit digits to the numbers 0-3.	Multiply two-digit numbers by one-digit numbers using rectangular arrays or area models. Limit digits to the numbers 0–5.

CCSS.MATH.CONTENT.4.NBT.B.6 Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	Solve division word problems.	Identify the picture that shows equal groups.	Solve division word problems within 20, using manipulatives or drawings without remainders.	Solve word problems involving division without remainders. Limit to two-digit dividends.	Solve word problems involving division with remainders. Limit to two-digit dividends.
CCSS.MATH.CONTENT.4.NF.A.1 Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × b) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.	Identify equivalent fractions.	Compare rectangular area models of unit fractions to determine which is smaller, larger, or equal.	Using visual fraction models, recognize equivalent fractions. Limit to fractions with denominators 2 and 4 and 5 and 10.	Using visual fraction models, recognize equivalent fractions. Limit to fractions with denominators 2, 4, 8, and 5 and 10.)	Using visual fraction models, recognize equivalent fractions. Limit to fractions with denominators 2, 4, 8, 3 and 6, and 5 and 10).
CCSS.MATH.CONTENT.4.NF.A.2 Compare two fractions with different numerators and different denominators (i.e., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2). Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions (i.e., by using a visual fraction model).	Compare two fractions by creating common denominators or numerators or benchmark fractions given visuals.	Identify the numerator and denominator of a fraction.	Identify visual fraction models that are equivalent to 1/2 or 1 whole.	Given visual models, compare two fractions, using the language or symbols >, =, or <. Limit to fractions with denominators 2, 4, 8, and 5 and 10).	Given visual models, compare two fractions, using the language or symbols >, =, or <. Limit to fractions with denominators 2, 4, 8, 3 and 6, and 5 and 10).
CCSS.MATH.CONTENT.4.NF.B.3b Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions by using a visual fraction model. Examples: 3/8 = 1/8 + 1/8 + 1/8; 3/8 = 1/8 + 2/8; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.	Decompose a fraction in more than one way (same denominators).	Identify a fraction that has the same denominator as a given fraction.	Given a fraction, identify an equivalent addition expression, using unit fractions, that represents that fraction. Limit to denominators 3 and 4.	Given a fraction, identify an equivalent addition expression that represents that fraction. Limit to denominators 3, 4, 6, and 8.	Decompose a fraction into a sum of two fractions.
CCSS.MATH.CONTENT.4.NF.B.3c Add and subtract mixed numbers with like denominators (i.e., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction).	Add or subtract mixed numbers and whole numbers.	Match a visual representation of a fraction to its numerical representation.	Match a visual representation of a mixed number to its numerical representation.	Using visual or object models, add or subtract a mixed number and a whole number.	Add or subtract a mixed number and a whole number (no visuals).

CCSS.MATH.CONTENT.4.NF.B.3d Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.	Solve word problems involving the addition or subtraction of fractions with like denominators.	Match a visual or object model to a simple one-step word problem. Limit to unit fractions with like denominators of 2, 3, and 4.	Given visual or object models, solve one-step addition word problems involving unit fractions. Limit to like denominators of 2, 3 or 4.	Use a visual or object model to solve simple one-step addition or subtraction fraction word problems. Limit to like denominators.	Solve one-step word problems involving addition or subtraction of fractions. Limit to like denominators.
CCSS.MATH.CONTENT.4.NF.B.4c Solve word problems involving multiplication of a fraction by a whole number by using visual fraction models and equations to represent the problem. For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be five people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?	Solve word problems involving multiplication of a unit fraction by a whole number.	Find the product of any single digit number multiplied by 1.	Find the product of two single-digit numbers	Solve word problems involving multiplying a unit fraction by a single digit whole number.	Solve word problems involving multiplying a unit fraction (denominators $\leq$10) by two-digit whole numbers.
CCSS.MATH.CONTENT.4.NF.C.5 Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.	Add fractions with denominators of 10.	Match visual models to fractions with the denominator 10.	Match visual models to fractions with the denominators 10 or 100.	Given visual models, add fractions with denominators of 10.	Given visual models, add fractions with denominators of 100.
CCSS.MATH.CONTENT.4.NF.C.6 Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.	Identify decimal notation for fractions with denominators of 10 and 100.	Identify the decimal notation value of a penny, dime, and dollar.	Identify the decimal notation value of coins: penny, nickel, dime, quarter or a dollar. For example: 0.01, 0.05, 0.10, 0.25., and 1.00.	Identify the decimal fraction equivalence of coins: penny, nickel, dime, quarter or a dollar. For example: 1/100, 5/100, 10/100, 25/100, 100/100.	Translate between cents notation and dollar-cents notation up to $1. For example, 75¢ = $0.75.
CCSS.MATH.CONTENT.4.NF.C.7 Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions (i.e., by using a visual model).	Compare two decimals.	Compare the value of a penny and a dime represented in decimal notation.	Compare the value of two different coins or and select the correct inequality statement of their decimal equivalent. Limit to penny, nickel, dime, and quarter.	Compare the value of two different coins or a coin and a dollar and select the correct inequality statement of their decimal equivalent. Limit to penny, nickel, dime, quarter, and dollar.	Compare the value of two sets of the same types of coins and select the appropriate inequality statement that describes their relative decimal representations. For example, 3 dimes compared to 7 dimes or 0.30 < 0.70.

CCSS.MATH.CONTENT.4.MD.A.1 Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb., oz.; l, ml; hr., min., sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. For example, know that 1 ft. is 12 times as long as 1 in. Express the length of a 4 ft. snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...	Convert measurement units (larger to smaller).	Identify a unit of measurement. For example, what do we measure time with? Minutes, feet, pounds…	Identify smaller units that comprise a larger unit (i.e., a foot is made up of inches; a minute is made up of seconds).	Convert larger unit to smaller unit (e.g., 1 minute = 60 seconds, 1 foot = 12 inches).	Complete a table to convert measurement units.
CCSS.MATH.CONTENT.4.MD.A.2 Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.	Solve word problems using the four operations involving time and money.	Read a clock (limit to hour and half hour). Determine the value of a given amount of money. Limit to whole dollars or problems involving a single coin type (i.e., penny, dime, or dollar). Note: to match standard C6 coins	Determine the amount of elapsed time (limit to hours) Add two amounts of money together. Limit to whole dollars or problems involving single coin type (i.e., penny, nickel, dime, quarter, dollar)	Determine the amount of elapsed time using a schedule (limit to half hour). Determine the amount of money needed to make a purchase. Limit to whole dollars or problems involving single coin type (i.e., quarters, dimes, or nickels).	Determine the amount of elapsed time using a schedule (limit to quarter hour). Determine the amount of money needed to make a purchase (limit to whole dollars or two coin types).
CCSS.MATH.CONTENT.4.MD.A.3 Apply the area and perimeter formulas for rectangles in real-world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.	Solve real-world problems involving the area of rectangles.	Find the perimeter of a rectangle or square when given all sides.	Given a real-world problem and two side lengths of a rectangle or one side of a square, determine the perimeter.	Given a real-world problem, find the area of a rectangle or square given two side lengths.	Given a real-world problem, find the area of a square given one side length. Given the perimeter of a square, find one of its side lengths.
CCSS.MATH.CONTENT.4.MD.B.4 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots. For example, from a line plot, find and interpret the difference in length between the longest and shortest specimens in an insect collection.	Solve one-step addition or subtraction measurement problems using data presented in a line plot.	Identify the line plot that shows the given measurement data. Limit to whole numbers.	Solve one-step addition measurement problems by using information presented in a line plot. Limit to whole numbers; limit line plot to 5 data points.	Solve one-step addition or subtraction measurement problems by using information presented in a line plot. Limit to whole numbers; limit line plot to 5 data points.	Solve one-step addition problems by using information presented in a line plot. Limit to halves; limit line plot to 4 data points.

CCSS.MATH.CONTENT.4.MD.C.6 Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.	Measure angles with a protractor.	Recognize a protractor as a tool used to measure angles.	Identify an angle measure as larger, smaller, or the same as another angle measure.	Identify a correctly placed protractor over an angle measure.	Given the image of an angle on a protractor, identify the measure of the angle. Only have angles opening to the right; vertex on 0, measurements lined up with 5s or 10s.
CCSS.MATH.CONTENT.4.MD.C.7 Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real-world and mathematical problems, i.e., by using an equation with a symbol for the unknown angle measure.	Solve problems involving angle addition.	Given a visual, a real-world context, three points on the same line segment, and the distances between each set of points, find the total length of the line segment.	Given a visual, a real-world context, three points on the same line segment, the distances between one set of points, and the total length of the line segment, find the missing distance between the other set of points.	Given a visual, a real-world context, solve problems involving the sum of two angle measures (up to 180 degrees).	Solve problems involving the addition or subtraction of two or more angle measures (up to 180 degrees).
CCSS.MATH.CONTENT.4.G.A.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.	Identify points, lines, line segments, rays, angles (right, acute, obtuse).	Identify a point and a line.	Identify lines, line segments, rays.	Identify right angles, and parallel and perpendicular lines.	Identify right, acute, obtuse angles, points, or lines segments in a two-dimensional figure.
CCSS.MATH.CONTENT.4.G.A.2 Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.	Identify parallel and perpendicular lines.	Identify lines.	Identify parallel lines.	Identify pairs of parallel and perpendicular lines.	Identify pairs of parallel and perpendicular sides in shapes.
CCSS.MATH.CONTENT.4.G.A.3 Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.	Identify lines of symmetry.	Given a half image of a circle, triangle, or heart, and a vertical line of symmetry, identify the missing half.	Given a half image of a symmetrical object, and a vertical or horizontal line of symmetry, identify the missing half.	Given a rectangle or square and a line drawn across the shape (excluding diagonals through the vertices), determine if it is a line of symmetry.	Given a shape and a line drawn across the shape (excluding diagonals through the vertices), determine if it is a line of symmetry.

GRADE 5
MATHEMATICS

		Grade 5 Mathematics Achievement Level Descriptors			
Common Core Standard	Essence Statement	Beginning	Approaching	Meets	Exceeds
CCSS.Math.Content.5.OA.A.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.	Evaluate numerical expressions using grouping symbols (only parentheses).	Add pictorial expressions. Sum should also be represented as pictures.	Add pictorial expressions with parentheses. Sum should also be represented as pictures.	Evaluate addition and subtraction expressions using parentheses.	Evaluate expressions using parentheses. Limit to 3 terms.
CCSS.Math.Content.5.OA.A.2 Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. For example, express the calculation “add 8 and 7, then multiply by 2” as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.	Match simple verbal expressions to numerical expressions.	Identify the expression that matches the verbal description of a one- step addition or problem. Limit verbal description of addition to 'sum', 'add to', and 'plus'.	Identify the expression that matches the verbal description of a one-step subtraction problem. Limit verbal description of subtraction to 'difference', 'subtract' ' and 'minus'.	Identify the expression that matches the verbal description of a one-step multiplication problem. Limit verbal description of multiplication to 'product', 'multiplied by', and 'times'.	Identify the expression that matches the verbal description of a one-step division problem. Limit verbal description of division to 'quotient' and 'divided by'. Include 'subtract from' in translating subtraction verbal expressions at this level.
CCSS.Math.Content.5.OA.B.3 Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on acoordinate plane. For example, given the rule “add 3” and the starting number 0, and given the rule “add 6” and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.	Given two sequences, identify the next term of each sequence. The rules for each number pattern should be related.	Identify the next number in a sequence with a given rule.	Identify the rule when given a sequence.	Given two sequences, identify the next term of each sequence.	Given two sequences, create an ordered pair.
CCSS.Math.Content.5.NBT.A.1 Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.	Understand place value involving multi-digit numbers (for digits to the left and right of a given digit).	Identify the digit that is in the ones, tens, or hundreds place.	Identify the number in a set that has a given number of tens.	Given a number, identify the number that is ten times greater. Limit to three-digit numbers.	Given a number that is a multiple of 10, identify the number that is one-tenth the value. Limit to three-digit numbers.

CCSS.Math.Content.5.NBT.A.2 Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.	Understand powers of 10.	Identify simple number patterns.	Identify patterns that result from multiplying numbers (1-5) by 10.	Identify patterns that result from multiplying numbers (1-9) by 10, 100, or 1000.	Identify patterns that result from multiplying two-digit numbers by 10, 100, or 1000.
CCSS.Math.Content.5.NBT.A.3a Read and write decimals to thousandths using base 10 numerals, number names, and expanded form (e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000)).	Match number names to decimal numbers. Match whole numbers to numbers written in expanded form.	Match number names to numbers. Limit to three digits.	Match number names to decimal numbers. Limit to four digits, including tenths.	Match number names to decimal numbers (limit to five digits, including hundredths). Write whole numbers in expanded form (limit to three digits including hundredths).	Match number names to decimal numbers (limit to six digits, including hundredths). Write whole numbers in expanded form (limit to four digits, including hundredths).
CCSS.Math.Content.5.NBT.A.3b Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	Compare decimals using >, =, < (e.g., money).	Compare two visual models of whole numbers using symbols or words (limit to two digits).	Compare two visual models of whole numbers using symbols or words (limit to three digits).	Given two visual models of a decimal (limit to tenths), compare the decimals using language or symbols: >, =, <.	Given two visual models of a decimal (limit to hundredths), compare the decimals using language or symbols: >, =, <. Compare two decimals to tenths using >, =, < symbols (no visual).
CCSS.Math.Content.5.NBT.A.4 Use place value understanding to round decimals to any place.	Round decimals to the nearest whole number.	Round whole numbers graphed on a number line.	Use a number line to place a decimal to tenths place and determine if the decimal is closer to zero or 1.	Round decimals to tenths to the nearest whole number.	Round decimals to hundredths to the nearest whole number.
CCSS.Math.Content.5.NBT.B.5 Fluently multiply multi-digit whole numbers using the standard algorithm.	Multiply a three-digit whole number by a one-digit whole number using the standard algorithm.	Use manipulatives, a visual model, or the standard algorithm to multiply 10 or 100 by a one-digit whole number.	Multiply 10 or 100 by a one- or two-digit whole number.	Multiply a three-digit whole number by a one-digit whole number using the standard algorithm.	Multiply a two-digit whole number by a two-digit whole number using the standard algorithm.
CCSS.Math.Content.5.NBT.B.6 Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	Divide whole numbers using any strategy.	Using a visual representation or manipulatives, given a two-digit whole number, divide by a one-digit whole number with no remainder. Limit to numbers within 20 with divisor 2.	Using a visual representation or manipulatives, given a two-digit whole number, divide by a one-digit whole number with no remainder. Limit to numbers within 50 with divisors: 2 and 5.	Using a visual representation or manipulatives, given a two-digit whole number, divide by a one-digit whole number with no remainder. Limit to numbers within 100 with divisors: 1, 2, 5, and 10.	Given a two-digit whole number, divide by a one-digit whole number with no remainder. Limit to numbers within 100 with divisors: 1, 2, 5, and 10.

CCSS.Math.Content.5.NBT.B.7 Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.	Add and subtract decimals (e.g., calculating money).	Add decimal numbers using manipulatives (e.g., coins) or visuals.	Subtract decimal numbers using manipulatives (e.g., coins) or visuals.	Add and subtract decimal numbers using manipulatives (e.g., coins) or visuals.	Multiply coin denominations or dollar and cent amounts limited to nickel increments by whole numbers using manipulatives (e.g., coins) or visuals and various strategies such as repeated addition.
CCSS.Math.Content.5.NF.A.1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)	Using a visual representation or manipulatives, add and subtract fractions with unlike denominators.	Using a visual representation or manipulatives, identify fractions with like and unlike denominators.	Using a visual representation or manipulatives, given two fractions with unlike denominators, identify the common denominator (denominators limited to 2, 3, 4, 6, and 8).	Using a visual representation or manipulatives, add and subtract fractions with unlike denominators (denominators limited to 2, 3, 4, 6, and 8).	Add and subtract fractions with unlike denominators (denominators limited to 2, 3, 4, 5, 6, 8, and 10).
CCSS.Math.Content.5.NF.A.2 Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators (i.e., by using visual fraction models or equations to represent the problem). Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.	Using a visual representation or manipulatives, solve addition or subtraction word problems involving fractions.	Using a visual representation or manipulatives, solve addition word problems involving unit fractions with like denominators (2, 3).	Using a visual representation or manipulatives, solve addition and subtraction word problems involving unit fractions with like denominators (2, 3, 4).	Using a visual representation or manipulatives, solve addition or subtraction word problems involving fractions (denominators limited to 2, 3, 4, 6, and 8).	Solve addition or subtraction word problems involving fractions (denominators limited to 2, 3, 4, 6, and 8).
CCSS.Math.Content.5.NF.B.3 Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers (e.g., by using visual fraction models or equations to represent the problem). For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people, each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?	Given a real-world context, connect fractions with division, understanding that a/b = a ÷ b (b may not equal 0).	Given a visual, match the story to the division expression that represents it. Limit division within 20.	Match the story to the fraction model that represents it. Limit division expressions to 1 ÷ 2 , 1 ÷ 3, or 1 ÷ 4 = model of 1 object 4. For example, “Bob has 1 pizza. The pizza is divided in two. Which picture shows Bob's pizza?”	Solve a real-world context using visuals and/or manipulatives that relate to division of 1 by a unit fraction. Limit division expressions to 1 ÷ 2 , 1 ÷ 3, or 1 ÷ 4 = model of 1 object 4. For example, “Bob has 1 pizza. The pizza is divided in two. Which fraction shows Bob's pizza?”	Match different representations for a given fraction division problem context that results in a fractional answer. For example, “three pizzas are shared by four people” equated with area model visual of three circles divided into four parts with four color-coded people each receiving three of the quarters or 3/4 share or 3/4 = 3 ÷ 4 or “three divided by four”.

CCSS.Math.Content.5.NF.B.4 Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.	Multiply a unit-fraction by a whole number.	Given a visual model of two unit fractions with the same denominator, identify their sum.	Add two unit fractions with the same denominator.	Multiply a unit-fraction by a whole number (limit to 1-4) using a visual model or repeated addition.	Multiply a unit-fraction by a whole number.
CCSS.Math.Content.5.NF.B.4b Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.	Find the area of a rectangle with fractional side lengths by tiling.	Find the area of a tiled rectangle with whole number side lengths.	Find the area of a tiled rectangle where one side is a fractional length and the other side is an even whole number length (limit to 1/2).	Find the area of a tiled rectangle where one side is a fractional length and the other side is a whole number length. Limit to 1/2 or mixed numbers with a fractional part of 1/2.	Find the area of a tiled rectangle where one side is a fractional or mixed number length and the other side is a whole number length that is a multiple of the denominator.
CCSS.Math.Content.5.NF.B.6 Solve real-world problems involving multiplication of fractions and mixed numbers, for example, by using visual fraction models or equations to represent the problem.	Identify expressions that match real-world contexts that require multiplying a fraction by a whole number.	Identify a mixed number shown in a model. Limit fractional part to one-half, one-third, or one- quarter.	Identify a mixed number shown in a model. Limit fractional part to non-unit fractions with a denominator of 2, 3, and 4.	Identify expressions that match real-world contexts that require multiplying a unit fraction by a whole number. For example, a 1/4 mile X 4-person relay race or doubling/tripling a recipe which calls for 1/2 cup or 1/3 cup ingredient measures.	Identify expressions that match real-world contexts that require multiplying a mixed number that is made of a whole number and unit fraction by a whole number (whole number must be equivalent to the unit fraction's denominator). For example, doubling or tripling a recipe which calls for 1 1/2 cup or 1 1/3 cup ingredient measures.
CCSS.Math.Content.5.NF.B.7 Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.	Given a visual model and real-world context, solve problems involving dividing a whole number by a unit fraction. (Limit whole numbers to 1-5.)	Identify the number of halves, thirds, or quarters shown in a visual area model of 2/3, 3/3, or 4/4.	Given a visual model and real-world context, solve one divided by unit fraction problems. Limit unit fractions to denominators of 2, 3, and 4.	Given a visual model and real-world context, solve a whole number divided by unit fraction problems (limit whole numbers to 1-5, and unit fractions to denominators of 2, 3, and 4). For example, given an area model, ask how many 1/4 pie slices are inside two whole pies?	Given a visual model and real-world context, solve unit fractions divided by whole number problems. Limit unit fractions to denominators of 2, 3, and 4, and whole numbers to 2, 3, and 4.

CCSS.Math.Content.5.MD.A.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real-world problems.	Use measurement conversions to solve real world problems.	Identify measurements (e.g., hr., min., ft., in., m, cm).	Identify measurement equivalents: 1 hour = 60 min; 1 foot = 12 inches; 1 meter = 100 cm.	Given a table with unit conversion shown, convert measurements from a larger to a smaller unit within a single system of measurement from a larger to a smaller unit (i.e., hr.-> min., ft.-> in., qt.-> cups, m-> cm).	Given a table with unit conversion shown, convert measurements within a single system of measurement (i.e., hr.<-> min., ft.<->in., qt.<->cups, m<->cm).
CCSS.Math.Content.5.MD.B.2 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.	Solve one-step addition or subtraction measurement problems involving line plots with fractions.	Identify the line plot that shows given data. Limit to whole numbers.	Solve one-step addition or subtraction measurement problems by using information presented in a line plot. Limit to whole numbers.	Solve one-step addition or subtraction measurement problems by using information presented in a line plot. Limit to whole numbers and halves.	Solve one-step addition or subtraction measurement problems by using information presented in a line plot. Limit to whole numbers, halves, and fourths.
CCSS.Math.Content.5.MD.C.4 Measure volume by counting unit cubes, using cubic cm, cubic in, cubic ft., and improvised units.	Measure volume by counting unit cubes.	Distinguish between a line segment, a square, and a cube.	Recognize that square units are the units of measure for area.	Recognize a cubic unit as the unit of measure for volume.	Identify the units of measure for length, area, and volume, as linear distance, square units, or cubic units.
CCSS.Math.Content.5.MD.C.5a Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes (i.e., to represent the associative property of multiplication).	Find the volume of right rectangular prisms with whole-number side-lengths by packing.	Given a visual model, find the area of a square or rectangle by counting unit squares. For example, what is the area of the square or rectangle?	Identify rectangles with the same area.	Find the volume of a rectangular prism that is packed with unit cubes. Limit to dimensions of 12 cubic units or less.	Given a rectangular prism with unit cubes shown, identify the rectangular prism with the same volume.
CCSS.Math.Content.5.MD.C.5b Apply the formulas V = l × w × h and V = b × h for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real-world and mathematical problems.	Understand the volume formulas for rectangular prisms.	Given a visual, identify the number of unit cubes that make up the base of the rectangular prism.	Find the area of the base of a rectangular prism or cube.	Match visuals of rectangular prisms to correct *l* X *w* X *h* formula. Limit to dimensions of 12 units or less.	Apply *l* X *w* X *h* or Base Area X h formula for rectangular prisms to find volume.

CCSS.Math.Content.5.MD.C.5c Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real-world problems.	Find the summed volume of two rectangular prisms (non-overlapping).	Given a rectilinear shape, find the area. Limit area to less than or equal to 25.	Given two rectilinear shapes, calculate the total area (maximum area up to 25).	Given the volume of two rectangular prisms or cubes, find the total volume.	Given the volume of one rectangular prism and the labeled dimensions for a second rectangular prism, find the total volume.
CCSS.Math.Content.5.G.A.1 Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).	Understand the coordinate plane.	Identify a number line.	Identify the x- and y-axes.	Given a coordinate plane, find the origin, and x- and y- axes.	Given a coordinate plane, identify a point in the first quadrant.
CCSS.Math.Content.5.G.A.2 Represent real-world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.	Identify the coordinates of a point plotted in the first quadrant.	Identify a point on a vertical number line.	Identify the x or y coordinates of a point plotted in the first quadrant.	Identify the coordinates of a point plotted in the first quadrant.	Plot a set of points in the first quadrant.
CCSS.Math.Content.5.G.B.3 Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles, and squares are rectangles, so all squares have four right angles.	Understand categories and subcategories of two-dimensional shapes.	Group shapes by the number of sides.	Identify shapes that have parallel sides, perpendicular sides, or right angle.	Group shapes by the presence/absence of parallel sides, perpendicular sides, or right angle. Find the shape that is different than the other shape(s) in the set.	Group shapes by two or more attributes.
CCSS.Math.Content.5.G.B.4 Classify two-dimensional figures in a hierarchy based on properties.	Classify two-dimensional shapes based on their properties.	Identify triangles and rectangles.	Identify different types of quadrilaterals.	Classify two-dimensional figures based on the properties of their sides or angles (triangles, quadrilaterals, pentagons).	Classify two-dimensional figures based on their properties (parallelograms vs. trapezoids, rectangles vs. rhombuses).

GRADE 6
MATHEMATICS

		Grade 6 Mathematics Achievement Level Descriptors			
Common Core Standard	Essence Statement	Beginning	Approaching	Meets	Exceeds
CCSS.Math.Content.6.RP.A.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, “The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak.” “For every vote candidate A received, candidate C received nearly three votes.”	Describe ratios within a context.	Use objects and pictures to identify the number of objects in a group, including object label. Match a description to a visual display of objects using ratio language. Limit to one set of no more than five objects.	Use objects and pictures to identify the number of objects in two groups (e.g., 1 apple, 3 bananas). Match a description to a visual display of two sets of objects using ratio language (limit to 8 objects).	Identify the ratio that matches the given picture or description with objects/pictures to illustrate (limit to numbers up to 10). Match a visually presented ratio with its description.	Explain the context of a ratio when relating to a real-world situation.
CCSS.Math.Content.6.RP.A.3a Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.	Identify missing values in ratio tables.	Given a real-world context or visual model or manipulatives, recognize a ratio.	Determine the ratio between two quantities. Limit to whole numbers up to 20.	Identify one missing value in a table of equivalent ratios in context. Limit to whole numbers up to 20.	Identify two missing values in a table of equivalent ratios in context. Limit to whole numbers.
CCSS.Math.Content.6.RP.A.3b Solve unit rate problems including those involving unit pricing and constant speed. For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?	Identify the unit rate in context.	Given a real-world context or visual model or manipulatives, recognize a rate.	Given a real-world context or visual model or manipulatives, recognize a unit rate.	Given a table and a context, identify the unit rate. Limit one quantity to 1, and the paired quantity to whole numbers.	Solve a unit rate problem within context.
CCSS.Math.Content.6.RP.A.3c Find a percent of a quantity as a rate per 100 (i.e., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.	Represent fractions as percents.	Given a real-world context or visual model or manipulatives, recognize a percent.	Given a real-world context or visual model or manipulatives, recognize that a percent means out of 100.	Given a fraction out of 100, represent it as a percent and vice versa.	Represent benchmark fractions as their corresponding benchmark percentages, given visuals and within context. Limit fractions to 1/4, 1/2, 3/4, 1/10 or 100/100.

CCSS.Math.Content.6.RP.A.3d Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.	Use ratios to convert measurement units.	Identify measurements (e.g., hr., min., sec., ft., in., qt., cups, m, cm, kg, g).	Identify measurement equivalents: 1 hour = 60 min.; 1 min = 60 sec.; 1 foot = 12 in.; 1 m = 100 cm; 1 qt. = 3 cups; 1 kg = 1,000 g).	Given a unit conversion, convert measurements from a larger to a smaller unit within a single system of measurement (i.e., hr.-> min., min-> seconds, ft.->in., qt.->cups, m->cm, kg -> g).	Given a unit conversion, convert measurements within a single system of measurement (i.e., hr.-> min., min<-> seconds, ft.->in., qt.->cups, m->cm, kg <-> g).
CCSS.Math.Content.6.NS.A.1 Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions (i.e., by using visual fraction models and equations to represent the problem). For example, create a story context for 2/3 ÷ 3/4 and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that 2/3 ÷ 3/4 = 8/9 because 3/4 of 8/9 is 2/3. (In general, a/b ÷ c/d = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb. of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 sq. mi?	Given a visual model and real-world context, solve problems involving dividing a whole number by a unit fraction.	Using real-world contexts, visual models or manipulatives, add and subtract unit fractions with like denominators (denominators of 2, 3, and 4).	Use real-world contexts, visual models, or manipulatives to divide 1 whole by unit fractions (limit denominators 2–4.)	Using real-world contexts, visual models, or manipulatives to divide whole numbers by unit fractions (limit denominators 2–4.)	Using real-world contexts, visual models or manipulatives, divide non-unit fractions by unit fractions (limit fractions to like denominators from 2–4.). For example, “How many fourths are inside three-fourths” matched with 3/4 ÷1/4 = 3.
CCSS.Math.Content.6.NS.B.2 Fluently divide multi-digit numbers using the standard algorithm.	Divide multi-digit numbers by one-digit numbers.	Using visual models or manipulatives, divide sets of objects into equal groups.	Divide two-digit numbers by one-digit numbers without remainders (limit quotient to single-digit).	Divide three-digit numbers by one-digit numbers (without remainders).	Divide three-digit numbers by one-digit numbers (with remainders).
CCSS.Math.Content.6.NS.B.3 Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.	Add, subtract, and multiply decimals.	Add decimal values associated with coins; e.g., 0.01, 0.05, 0.10, and 0.25.	Add and subtract numbers with decimals up to the hundredths place. Limit to real-world problems involving money.	Add, subtract, and multiply numbers with decimals up to the hundredths place. Limit to real-world problems involving money.	Add, subtract, multiply, and divide decimals up to the hundredths place. Limit to real-world problems involving money.
CCSS.Math.Content.6.NS.B.4 Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factor. For example, express 36 + 8 as 4 (9 + 2).	Identify a common factor or the least common multiple of two whole numbers.	Identify a factor pair for a single-digit number.	Identify a factor pair for a number. Limit whole number to 1–24.	Identify a common factor for two whole numbers (limit the two whole numbers to 1–24) or the least common multiple of even whole numbers within 10.	Identify common factors of two whole numbers (limit the two whole numbers to 1–50) or the least common multiple of two whole numbers 2–5, and 10.

CCSS.Math.Content.6.NS.C.6 Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.	Represent integers in a coordinate plane.	Identify the location of the origin on a coordinate plane.	Identify the coordinates of a point plotted in the first quadrant.	Identify the coordinates of a point plotted in any of the four quadrants.	Identify the quadrant that a given point lies within.
CCSS.Math.Content.6.NS.C.7b Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write -3 ˚C > -7 ˚C to express the fact that -3 ˚C is warmer than -7 ˚C.	Place integers in order from least to greatest or greatest to least.	Compare two whole numbers.	Use a number line to order whole numbers from least to greatest or greatest to least.	Use a number line to order integers from least to greatest or greatest to least (limit to +/- 3).	Interpret statements of order for integers in real-world contexts (for example, -3 degrees is warmer than -7 degrees).
CCSS.Math.Content.6.NS.C.7c Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. For example, for an account balance of -30 dollars, write |-30| = 30 to describe the size of the debt in dollars.	Understand that the absolute value of a number is its distance from 0.	Identify which whole number on a number line is at a given distance from 0. Limit to whole numbers.	Identify which two integers on a number line are at a given distance from 0. Limit to +/- 5.	Represent the absolute value of a given number (e.g., which represents the absolute value of -3? key would be |-3|).	Find the absolute value of a number (e.g., |-3| = 3).
CCSS.Math.Content.6.NS.C.8 Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.	Use a number line to find the distance between integer points.	Use a number line to find the distance between whole number points (limited to single digit numbers).	Use a number line to find the distance between a negative integer point and zero (limit to +/- 10).	Use a number line to find the distance between opposite integer points within +/- 5.	Use a number line to find the distance between negative integer points (limit integers to -1 through -10).
CCSS.Math.Content.6.EE.A.1 Write and evaluate numerical expressions involving whole-number exponents.	Evaluate numerical expressions involving exponents.	Identify the exponent in a numerical expression.	Evaluate numerical expressions involving exponents. Limit to base 10 and exponents 2 and 3.	Evaluate numerical expressions involving exponents. Limit bases to whole numbers 1-5 and 10 and exponents to 2 and 3.	Evaluate numerical expressions involving whole-number exponents (limit to two-step).
CCSS.Math.Content.6.EE.A.2a Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation, “Subtract y from 5” as 5 - y.	Translate verbal phrases into algebraic expressions.	Translate verbal phrases into one-step numerical expressions.	Identify a one-step algebraic expression with a variable in one operation.	Translate verbal phrases into one-step algebraic expressions with any of the four operations.	Translate verbal phrases into two-step algebraic expressions with any of the four operations. Limit expressions to one variable.

CCSS.Math.Content.6.EE.A.2b Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. For example, describe the expression 2 (8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms.	Identify the parts of an expression in mathematical terms.	When given manipulatives, drawings, or symbols, identify the parts of an expression in mathematical terms: sum or difference.	When given manipulatives, drawings, or symbols, identify the parts of an expression in mathematical terms: sum, difference, product, term, and variable.	Identify the parts of an expression in mathematical terms: sum, difference, product, factor, quotient, term, and variable. Limit to single variable and one operation.	Identify the parts of an expression in mathematical terms: sum, difference, product, factor, quotient, coefficient, term, and variable. Limit to two operations.
CCSS.Math.Content.6.EE.A.2c Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example, use the formulas $V = s^3$ and $A = 6 s^2$ to find the volume and surface area of a cube with sides of length s = 1/2.	Evaluate algebraic expressions involving formulas used in real-world problems.	Evaluate a missing addend numerical equation. Limit to sum within 10.	Identify the variable in a given two-step algebraic expression (e.g., y is the variable in 2y + 3).	Given a visual model, a context, and a formula, evaluate algebraic expressions involving the area of a rectangle (A = bh) and volume of a rectangular prism (V= lwh). Limit to single-digit whole numbers.	Given a visual model, a context, and a formula, evaluate algebraic expressions involving the area of a triangle (A = 1/2 bh), perimeter of a rectangle (P = 2l + 2w), or area of a square ($A = s^{2)}$. Limit side lengths to whole numbers 1-5 and 10.
CCSS.Math.Content.6.EE.A.3 Apply the properties of operations to generate equivalent expressions. For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.	Apply the commutative, associative, and/or the distributive properties of multiplication and addition to generate equivalent numeric expressions.	Use manipulatives, drawings, or symbols to apply the commutative or associative properties of addition to generate equivalent numeric expressions.	Use manipulatives, drawings, or symbols to apply the associative or commutative properties of addition or multiplication to generate equivalent numeric expressions.	Use manipulatives, drawings, or symbols to apply the associative/ commutative properties of addition/ multiplication and distributive property of multiplication to generate equivalent numeric expressions.	Apply the associative or commutative properties of addition/ multiplication and distributive property of multiplication to generate equivalent numeric expressions.
CCSS.Math.Content.6.EE.B.5 Understand solving an equation or inequality as a process of answering a question: Which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.	Use substitution to determine whether a given number makes an equation or inequality true.	Using manipulatives, drawings, or symbols to compare whole numbers using >,<, or =.	Compare whole numbers using >,<, or =.	Substitute a given number into an equation or inequality and determine if the statement is true. Limited to simple one-step algebraic equations and zero-step inequalities; e.g., x > 4 that have more than one solution.	Substitute a given number into an equation or inequality and determine if the statement is true.

CCSS.Math.Content.6.G.A.1 Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.	Find the area of right triangles and quadrilaterals.	Identify the shapes that any parallelogram or trapezoid could be composed of (show lines drawn in each to display the triangles or rectangles within).	Find the area of a rectangle or square.	Find the area of a right triangle (shown as a shaded portion of a rectangular frame). Limit rectangular frames for the triangle to even whole number products that can be easily divided by two.	Find the area of decomposed parallelograms and right trapezoids.
CCSS.Math.Content.6.G.A.2 Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V = l w h and V = b h to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.	Find the volume of a right rectangular prism.	Find the area of the base of a rectangular prism or cube.	When given a visual model, determine the volume of a rectangular prism by counting unit cubes.	Determine the volume of a rectangular prism using the formula V = lwh within a context (limited to whole number side lengths).	Determine the volume of a rectangular prism using the formula V = lwh within a context. Limit to one fractional edge lengths of 1/2, 1/3, or 1/4 with a paired multiple of the same denominator and a simple third edge length such as 10 units.
CCSS.Math.Content.6.G.A.3 Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.	Find the side lengths for a rectangle shown on a coordinate plane.	Identify the coordinates of the endpoints of a line segment.	Find the length of a vertical or horizontal line segment on a coordinate plane.	Given a rectangle on a coordinate plane, find the side lengths. Limit to whole numbers.	Given a set of points that represent different locations on a map and a coordinate plane, identify the vertical or horizontal distance between two locations. Limit each square unit to 1 block.
CCSS.Math.Content.6.G.A.4 Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.	Identify a three-dimensional figure using its net (two-dimensional deconstructed representation of a three-dimensional figure).	Identify prisms, pyramids, and cylinders.	Identify the two-dimensional shape that forms the base of a three-dimensional figure.	Identify the net for a cube, triangular prism, or rectangular prism or vice versa.	Identify the net for a triangular prism or a rectangular (or square) pyramid or vice versa.

CCSS.Math.Content.6.SP.A.1 Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. For example, “How old am I?” is not a statistical question, but “How old are the students in my school?” is a statistical question because one anticipates variability in students’ ages.	Identify the topic or question that may have been asked to produce a numeric data display (e.g., bar graph or dot plot).	Locate the title and labels for a numeric data display.	Identify the title, labels, and units for a numeric data display.	Identify a topic or question that may have been asked to obtain the data shown in a numeric data display.	Identify a statistical question.
CCSS.Math.Content.6.SP.A.2 Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.	Find the mode, range, and median of a given data set.	Find the mode of a given data set. Limit to an ordered data set with only 1 mode.	Find the range of a given data set.	Find the median of a given data set. Limit to an ordered data set with either 3 or 5 data points.	Find the mean of a given data set. Limit to an ordered data set with no more than 5 single-digit data points.
CCSS.Math.Content.6.SP.B.4 Display numerical data in plots on a number line, including dot plots, histograms, and box plots.	Match numeric data sets to numeric data displays.	Identify a data set plotted on a number line. Limit to three data points.	Identify a data set plotted on a dot plot. Limit to five data points.	Identify a data set plotted on a dot plot.	Identify a data set plotted on a dot plot, histogram, or box plot.
CCSS.Math.Content.6.SP.B.5 Summarize numerical data sets in relation to their context, such as by: a) reporting the number of observations, b) Describing the nature of the attribute under investigation, including how it was measured and its units of measurement, c) giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered, d) relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.	Interpret a numeric data set within context.	Given a real-world context, identify the appropriate unit of measure.	Given a numeric data set, determine the number of observations (limited to 2 categories and single-digit number of observations).	Given a real-world context and a numeric data set, identify the appropriate unit of measure and the number of observations.	Given a real-world context and numeric data set, identify the appropriate unit of measurement, the number of observations, and determine range, mode, median or mean.

GRADE 7
MATHEMATICS

		GRADE 7 MATHEMATICS Achievement Level Descriptors			
Common Core Standard	Essence Statement	Beginning	Approaching	Meets	Exceeds
CCSS.Math.Content.7.RP.A.1 Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units. For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour.	Use a ratio to model or describe a real-world relationship.	Given a visual model or manipulative, identify the unit rate in a real-world problem.	Solve a unit rate problem within context.	Identify the ratio that matches the description or vice versa. For example, there are 10 boys and 14 girls in a class. What is the ratio of girls to all students in the class? Use visuals when appropriate.	Use ratios to solve problems (i.e., limited to like units; one fraction and one whole number). For example, if a recipe calls for 1/4 cup sugar per 1 cup flour when doubling the recipe, how much sugar will you need?
CCSS.Math.Content.7.RP.A.2a Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.	Identify the proportional relationship between two quantities.	Given a visual model or manipulative, identify the proportional relationship between two quantities.	Identify the proportional relationship between two quantities. Limit to whole numbers.	Use a table or graph to identify if two ratios are proportional. Limit unit ratio to 1 and a whole number $\leq$ 10.	Identify the missing value for a ratio pair displayed in a table or graph of a proportional relationship (ratio table or graph should contain unit rate value, and proportion should use number multiples $\leq$ 10).
CCSS.Math.Content.7.RP.A.2b Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.	Identify unit rate.	Given a real-world context, visual model, or manipulatives, recognize a unit rate.	Identify the unit rate in a table within context.	Identify the unit rate in a graph within context.	Given a verbal description of a real-world context and an equation, identify the coefficient as the unit rate. For example, if you earn $7/hour, the equation would be E=7h with the coefficient referring to the hourly rate of earnings.
CCSS.Math.Content.7.RP.A.3 Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, and percent error.	Solve real-world and mathematical problems involving ratios and percentages.	Use visual models or manipulatives to represent ratios.	Use visual models or manipulatives to solve problems involving ratios.	Solve real-world and mathematical problems involving ratios (limit ratios to 1 and the whole numbers: 2, 3, 5, and 10) and percentages (limit to one-step word problems using 10% and 50%, such as identifying how much 10% off or 50% off is).	Use proportional relationships to solve ratio and percent problems (i.e., limited to percentages of 5, 10, 25 and 50). Examples: discount sales, gratuities, or tips.

CCSS.Math.Content.7.NS.A.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.	Identify the point that represents the sum of two integers.	Given a real-world context or visual model, identify integer or integer location on a number line. Limit to +/- 3.	Given a number line and an addition expression, identify the point that represents the sum. Limit to positive integers only; only move in the positive direction.	Given a number line and an addition expression, identify the point that represents the sum. Limit second addend to positive integers only.	Given a number line and an addition or subtraction expression, identify the point that represents the sum. Limit to integers; limit second addend to positive integers only.
CCSS.Math.Content.7.NS.A.1b Understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.	Recognize that a number and its opposite have a sum of 0.	Identify integer distance from zero. Limit to integers from +/- 3.	Given a number line model with plotted integer, identify the location of the integer that is at an equal distance from zero. Limit to integers from +/- 3.	Given a visual and an addition equation that has a sum of zero, identify the missing integer that makes the statement true. For example, -3 + _ = 0. Limit to integers from +/- 5.	Given an addition equation that has a sum of zero, identify the missing integer that makes the statement true. For example, -7 + _ = 0.
CCSS.Math.Content.7.NS.A.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.	Multiply and divide rational numbers.	Given a real-world context, visual model, or manipulatives, multiply a whole number by a unit fraction. Limit denominators to 2-5.	Given a real-world context, visual model, or manipulatives, divide a whole number by a unit fraction. Limit denominators to 2-5.	Given a real-world context, visual model, or manipulatives, divide a unit fraction by a whole number. For example, 1/2 ÷ 4 = 1/8.	Given a real-world context, visual model, or manipulatives, divide a non-unit fraction by a unit fraction. Limit to fractions with like denominators. For example, 3/4 ÷ 1/4.
CCSS.Math.Content.7.NS.A.2c Apply properties of operations as strategies to multiply and divide rational numbers.	Recognize equivalent expressions for fraction multiplication based upon the commutative property of multiplication.	Recognize equivalent expressions for whole number addition based upon the commutative property of addition (e.g., 3 + 2 = 2 + 3).	Recognize equivalent expressions for fraction addition based upon the commutative property of addition (e.g., 3 + 1/2 = 1/2 + 3 or 1/3 + 2/3 = 2/3 + 1/3).	Recognize equivalent expressions for fraction multiplication based upon the commutative property of multiplication (e.g., 2 x 1/2 = 1/2 x 2 or 1/2 x 1/4 = 1/4 x 1/2).	Solve multiplication or division problems involving positive fractions. Limit to halves, thirds, fifths, and tenths.

CCSS.Math.Content.7.NS.A.2d Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.	Convert a rational number to a decimal.	Match coin values of 0.01, 0.05, 0.10, and 0.25 to pennies, nickels, dimes, and quarters.	Identify the decimal equivalents for 1/100, 1/10, 1/4, and 1/2 (calculator allowed).	Convert a rational number to a decimal (calculator allowed). Limit to fractions with denominators of 2, 4, and 5 that generate non-repeating decimals.	Convert a rational number to a decimal (calculator allowed). Limit to fractions with denominators of 2, 4, 5, and 8 that generate non-repeating decimals.
CCSS.Math.Content.7.EE.A.1 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.	Add and subtract like terms.	Use manipulatives, drawings, or symbols to add symbolic expressions (e.g. combining visuals as "like terms" - square, square, square, triangle, triangle = 3 square + 2 triangle).	Identify like terms. Limit to one variable, two-term expressions with whole-number coefficients greater than one 1.	Add and subtract like terms. Limit to one variable with two term expressions with whole-number coefficients and one operation. If subtraction, difference must be a positive number.	Add and subtract like terms. Limit to two variables, up to four term expressions with whole number coefficients and one operation. If subtraction, difference must be a positive number.
CCSS.Math.Content.7.EE.B.3 Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example, if a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.	Solve two-step real-world problems involving integers.	Given a number line, visuals, or manipulatives, solve one-step mathematical problems involving whole numbers.	Given a number line, visuals, or manipulatives, solve one-step mathematical problems involving integers.	Given a number line, visuals, or manipulatives, solve one or two-step real-world problems involving integers.	Given a number line, visuals, or manipulatives, solve multi-step real-world problems involving integers.
CCSS.Math.Content.7.G.A.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.	Given two polygons and their side lengths, where Figure 1 is a scale image of Figure 2, determine the ratio of corresponding sides.	Identify shapes that have the same angle measures and/or side lengths. Limit to triangles and quadrilaterals; do not use 'congruent'.	Identify the rectangle or square that is double, triple, or 10 times greater than the given rectangle or square.	Given two polygons and their side lengths with the same orientation, where Figure 1 is a scale image of Figure 2, determine the ratio of corresponding sides. Limit to squares, rectangles, or triangles with side length ratios of 1:2, 1:3, 1:5, or 1:10.	Given two polygons and their side lengths with the same orientation, where Figure 1 is a scale image of Figure 2, determine the ratio of corresponding sides. Limit to side length ratios of 1:2, 1:3, 1:5, or 1:10.

CCSS.Math.Content.7.G.A.2 Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.	Match polygons with a given set of conditions.	Recognize the difference between open and closed, 3-, 4-, and 5-sided, and regular and irregular two-dimensional figures by matching "like" figures or congruent shapes.	Sort regular polygons according to their features such as number of sides, angle measures, equal side lengths, and equal angle measures. Limit to triangles, squares, rectangles, or pentagons. Do not use 'congruent'.	Identify a square or rectangle on a grid that has the given conditions (e.g., which square has side lengths of 5 units?).	Identify a right triangle on a grid that has the given conditions (e.g., which triangle has a 90-degree angle, a side length of 3 units, and a side length of 4 units?).
CCSS.Math.Content.7.G.A.3 Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.	Identify the faces (lateral faces and bases) of prisms.	Identify the shape that forms the base of a cylinder (i.e., the circle).	Identify the shape that forms the base of a cube (i.e., the square).	Identify the shape of the lateral face or base of a prism. Limit to cube, square prism, rectangular prism, or triangular prism.	Identify the base of a square pyramid or triangular pyramid or two faces of a square prism or triangular prism.
CCSS.Math.Content.7.G.B.4 Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.	Identify the expression that represents the circumference of a circle given its diameter.	Identify the parts of a circle (i.e., center, diameter, radius).	Given a circle with a labeled radius, identify diameter length.	Given a circle with a labeled diameter, the formula for the circumference, and context, identify the expression with the correctly substituted value, in terms of pi.	Given a circle with a labeled radius, the formula for area, and context, identify the expression with the correctly substituted value, in terms of pi.
CCSS.Math.Content.7.G.B.5 Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.	Identify if angles are complementary or supplementary.	Identify a right angle or a straight angle.	Identify the sum of two given angle measures and provide visuals of the angles with their measures.	Identify if two angles are complementary or supplementary. Limit to non-adjacent angles and angle measures that are multiples of 10.	Given one angle measure, identify its complement or supplement. Provide visuals and limit to non-adjacent angles; limit angle measures to multiples of 10.
CCSS.Math.Content.7.G.B.6 Solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.	Given a visual model or real-world context, solve real-world problems involving area and volume.	Given a visual model or real-world context, find the area of a tiled interior space or the volume of a cube filled rectangular prism. Limit volume to 12 unit cubes.	Given a visual model or real-world context, find the area of rectangles using: unit squares, the area of right triangles shown as a shaded portion of a rectangular frame, or the cube-filled rectangular prisms. Limit to a volume of 18 unit cubes.	Given a visual model or real-world context, find the area of squares, rectangles, triangles, and the volume of cubes and rectangular prisms. Limit to a volume of 24 unit cubes .	Given a visual model or real-world context, solve problems involving area and volume. Limit to triangles, rectangles, and rectangular prisms.

CCSS.Math.Content.7.SP.A.1 Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.	Understand that a sample is a subset of a population.	Given a statistical question, identify the population.	Identify a representative sample of a given population.	Given a set of data, answer questions about the sample population.	Understand that random sampling tends to produce representative samples.
CCSS.Math.Content.7.SP.A.2 Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. For example, estimate the mean word length of a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.	Interpret and answer questions about a given data set.	Given a statistical question, identify the population.	Identify if a given sample is representative of a population. For example, would a sample of girls represent the population of students in a typical classroom?	Given a set of data, answer questions related to the data.	Given a set of data, draw inferences about a population.
CCSS.Math.Content.7.SP.B.3 Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team. On a dot plot, the separation between the two distributions of heights is noticeable.	Given a visually displayed data set, compare measures of center.	Identify the mode of a visually displayed data set.	Identify the mode or median of a visually displayed data set.	Compare the mode or median of two visually displayed data sets.	Given two sets of visually displayed data, make comparative inferences.
CCSS.Math.Content.7.SP.B.4 Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.	Use the numerical measures of center (mean, median, mode, and range) to compare two populations.	Identify the mode or median of a visually displayed data set.	Identify the mean of a visually displayed data set.	Use numerical measures of center to compare two sets of data within a single graph (e.g., dot plot, pictograph, bar graph).	Given two sets of visually displayed data, make comparative inferences.

CCSS.Math.Content.7.SP.C.5 Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event. A probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.	Identify the likelihood of a simple event.	Given a probability model represented as a spinner with different sections labeled as A, B, C, etc., determine which section is the largest or smallest. Limit to models that show 2, 3 and 4 sections.	Given a probability model represented as a spinner with different-sized sections labeled A, B, C, etc., determine which section the spinner is the most likely to land on. Limit to models that show 2, 3 and 4 sections.	Identify the likelihood of a simple event given a model; (e.g. impossible, unlikely, 50-50, likely, certain). For example, given a tree diagram showing the possible outcomes for flipping a coin two times, identify the likelihood of landing on heads twice in a row as unlikely.	Identify the likelihood of a complex event given a model; (e.g. impossible, unlikely, 50-50, likely, certain).
CCSS.Math.Content.7.SP.C.8 Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.	Identify the possible outcomes of a simple event.	Given a graphic organizer, visual model, or context, identify the likelihood of an event (e.g. impossible, unlikely, 50-50, likely, certain).	Identify some possible outcomes of a simple event. For example, rolling one die, tossing a coin, etc.	Identify the number of possible outcomes of a simple event. For example, rolling a die, tossing a coin, etc.	Determine the probability of a simple event. For example, rolling one die, tossing a coin, etc.

GRADE 8
MATHEMATICS

		Grade 8 Mathematics Achievement Level Descriptors			
Common Core Standard	Essence Statement	Beginning	Approaching	Meets	Exceeds
CCSS.Math.Content.8.F.A.1 Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.	Determine if a relation is a function.	Plot points on a coordinate plane.	Identify the inputs and outputs of a relation represented as a set of ordered pairs or a table of values.	Given a relation represented as a graph of a line or curve, determine if it represents a function.	Given a relation represented as a set of ordered pairs or a table of values, determine if the relation represents a function.
CCSS.Math.Content.8.F.A.2 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.	Compare the rates of change of two different linear functions.	Identify the rate of change for a linear function represented as a table or graph. Limit to linear functions of the form, y = mx.	Identify the rates of change for two linear functions represented in the same way (i.e., two tables or two graphs). Limit to linear functions of the form, y = mx.	Compare the rates of change of two linear functions represented in the same way (i.e., two tables or two graphs). Limit to identical inputs. Limit to linear functions of the form, y = mx.	Compare two linear functions represented in a different way (table and graph only). Limit to linear functions of the form, y = mx.
CCSS.Math.Content.8.F.A.3 Interpret the equation y = mx + b as defining a linear function whose graph is a straight line. Give examples of functions that are not linear. For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4), and (3,9), which are not on a straight line.	Given a graph, identify if a function is linear or non-linear.	Identify the images that show a line or a curve.	Given three points, determine if it forms a line. Points are in the first quadrant only.	Identify whether an equation with its graph represents a linear or non-linear function. Limit quadratics to $a=x^2$.	Identify whether an equation (without its graph) represents a linear or nonlinear function. Limit linear function to y=mx and quadratics to $a = x^2$.
CCSS.Math.Content.8.F.B.4 Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.	Identify the rate of change of a linear function based on the context it models.	Given the graph of a line, identify the coordinates of the point where it intersects the y-axis.	Identify the topic, variable(s), and units of measure of a linear graph that is titled and labeled. Identify if a linear graph is increasing, decreasing, or constant.	Identify the rate of change from a verbal description given its table or graph of a linear function. Limit to linear functions of the form, y=mx, where m =0, 1, 2, 3, 5, 10.	Given a function, recognize the y-intercept as the initial value within a context.

CCSS.Math.Content.8.F.B.5 Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.	Identify the relationship between two quantities of a linear function.	Identify the topic or variable(s) of a linear graph that is titled and labeled.	Identify the topic, variable(s), and units of measure of a linear graph that is titled and labeled.	Describe the relationship between two quantities of a linear function (e.g., increasing, decreasing, or constant) graphed in quadrant I given a real-world context or verbal description.	Determine if a linear graph that has been described verbally is increasing or decreasing.
CCSS.Math.Content.8.NS.A.1 Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion. For rational numbers, show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.	Understand that all rational numbers can be expressed as a decimal.	Identify fractions that are tenths and hundredths.	Match tenths and hundredths between fraction and decimal forms.	Convert a rational number to a decimal (calculator allowed). Limit to decimals that end in the hundredths place.	Convert a rational number to a decimal and round to the nearest tenth, hundredth or thousandth.
CCSS.Math.Content.8.NS.A.2 Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π2). For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.	Approximate the location of given irrational numbers on a number line.	Identify a number as rational or irrational.	Identify a decimal approximation for a given irrational number. Limit to pi, $\sqrt{2}$, and $\sqrt{5}$.	Given an irrational number, estimate its location on a number line Limit to square roots less than $\sqrt{25}$.	Compare irrational numbers to given whole numbers. For example, pi is greater than 3.
CCSS.Math.Content.8.EE.A.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.	Understand that exponents represent repeated multiplication.	Identify exponents. For example, which expression has an exponent: 3x, 3+x, or x^3? Or, here is a expression: $2x^3$. What is the exponent? 2 or x or 3?	Express single-digit exponents in expanded form and vice versa. For example, $3^2 = 3 \times 3$ or $7 \times 7 = 7^2$. Limit to 2 terms.	Identify equivalent numerical expressions involving the product rule. Limit exponents to positive single digits up to 4. Limit sum of powers to 7. For example, $3^4 \times 3^3 = 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3 = 3^7$.	Identify equivalent numerical expressions involving the power rule. Limit exponents to positive single digits up to 4. For example, $(3^4)^4 = 3^4 \times 3^4 \times 3^4 \times 3^4 = 3^{16}$.
CCSS.Math.Content.8.EE.A.2 Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.	Understand that squaring the square root of a number results in the original number.	Using manipulative or visual representations, represent perfect squares up to 25.	Evaluate the square roots of perfect squares up to 25. For example, $\sqrt{25} = 5$.	Understand that squaring the square root of a number results in the original number. For example, $\sqrt{2} \times \sqrt{2} = 2$.	Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Limit to cubes up to 125.

CCSS.Math.Content.8.EE.A.3 Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. For example, estimate the population of the United States as 3 times 10^8 and the population of the world as 7 times 10^9, and determine that the world population is more than 20 times larger.	Compare numbers expressed in the form of a single digit times an integer power of 10.	Compare single-digit numbers (<, >, =).	Compare powers of 10 with single-digit exponents (<, >, =).	Compare numbers expressed in the form of a single digit times an integer power of 10 (<, >, =).	Compare numbers expressed in the form of a single digit times an integer power of 10 (<, >,=) and interpret within context.
CCSS.Math.Content.8.EE.A.4 Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.	Understand numbers expressed in scientific notation.	Identify the repeated multiplication equivalent of a power of 10 with single-digit exponent. For example, $10^3 = 10\times10\times10$.	Identify the standard form conversion of a power of 10 with single-digit exponent. For example, $10^3 = 1{,}000$.	Identify equivalent scientific notation and integer forms. For example, $6 \times 10^3 = 6{,}000$.	Identify conversion equivalent between scientific notation into integer form involving a decimal (e.g. $1.3 \times 10^3 = 1{,}300$). Limit to positive exponents and positive numbers.
CCSS.Math.Content.8.EE.B.5 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.	Represent and interpret proportional relationships.	Given a table of values, identify the x and y value.	Given a table or graph of a proportional relationship, identify the unit rate. Limit to whole numbers. Each table must contain start and unit rate values.	Given the graph of a line, identify the slope (rate of change). Compare two different proportional relationships that are represented in the same way. Limit to comparing two tables or comparing two graphs.	Identify the same proportional relationship represented in two different ways. For example, when given a graph of a proportional relationship, identify the table with the same relationship.
CCSS.Math.Content.8.EE.B.6 Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.	Identify the slope of a line.	Given the coordinates of two points, locate them on the coordinate plane.	Given the coordinates of two points, determine the slope	Given the graph of a line, identify the slope. Limit to linear functions with a slope of 1, 2, 3, 5, and 10 that are of the form y = mx.	Given the graph of a line, identify the slope. Limit to linear functions of the form, y = mx.
CCSS.Math.Content.8.EE.C.7 Solve linear equations in one variable.	Solve linear equations in one variable.	Identify the variable in a one- step algebraic expression.	Evaluate a one-step algebraic expression using substitution. Limit to addition, subtraction, or multiplication.	Solve a one-step equation (y + 3 = 5). Limit to addition, subtraction, or multiplication equations.	Solve a two-step equation in one variable (2y+3=5). Limit to addition, subtraction, or multiplication.

CCSS.Math.Content.8.EE.C.7b Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	Solve linear equations with rational number coefficients.	Identify the coefficient in a one-step algebraic equation.	Solve one-step equations with whole number coefficients. Limit to coefficients of 1 or 2.	Solve one-step equations with a coefficient of 1/2 (e.g., 1/2 x = 10).	Solve one-step equations with rational number coefficients. Limit to positive unit fractions with denominators of 2, 3, 4, 5 or 10; solutions must be within 100. For example, 1/4 x = 5, x = 20.
CCSS.Math.Content.8.EE.C.8a Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs because points of intersection satisfy both equations simultaneously.	Given a graph, identify the solution of a linear system.	Identify the coordinates of a point on a line.	Identify if a graph of a system of linear equations is intersecting or not intersecting.	Given a graph of a system of linear equations, identify the point of intersection.	Given a graph of a system of linear equations, identify the solution. Limit to no solution or one solution.
CCSS.Math.Content.8.G.A.1 Verify experimentally the properties of rotations, reflections, and translations.	Recognize that rigid transformations preserve distance and angle measures.	Match a given segment with another segment that has the same length or a given angle with another angle that has the same measure.	Identify if a turn, flip, or slide maps a line segment or angle onto another.	Identify the length of a line segment or angle measure after a rotation, reflection, or translation (given the side length or angle measure of the pre-image).	Identify the length of a line segment graphed in the first quadrant after a rotation, reflection, or translation.
CCSS.Math.Content.8.G.A.2 Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations. Given two congruent figures, describe a sequence that exhibits the congruence between them.	Identify the rigid transformation that maps one figure onto another.	Define the given rigid transformation (e.g., rotate = turn, reflection = flip, translation = slide).	Given familiar everyday objects, identify whether a rotation or reflection maps one object onto another.	Given two congruent rectangles, squares, or triangles, determine which single rigid transformation can be used to map one shape onto the other.	Given two congruent rectangles, squares, or triangles, determine which two rigid transformations can be used to map one shape onto the other.
CCSS.Math.Content.8.G.A.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	Identify the differences between an image and pre-image of a point or line segment after a reflection or translation.	Identify the coordinates of a point in the first quadrant of the coordinate plane.	Identify whether the line of reflection is the x-axis or the y-axis, given point or line segment pre-image and image on a coordinate plane.	Identify the image of a line segment after a reflection over the x- or y- axis or a single translation.	Identify the coordinates of a point after a reflection over the x- or y-axis or a single translation.
CCSS.Math.Content.8.G.A.4 Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations. Given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.	Identify the image of a rectangle or square after a dilation.	Differentiate between congruent and non-congruent shapes.	Given a line segment and its length, determine the line segment that is 2, 3, 4, 5, or 10 times its length.	Determine the image of a rectangle or square after a dilation given its side lengths. Limit constant of dilations to 2, 3, and 5.	Given a rectangle or square on a coordinate plane, identify its image after a dilation. Limit constant of dilations to 2, 3, and 5.

CCSS.Math.Content.8.G.A.5 Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.	Recognize that the sum of the angles in triangles is 180˚ and that vertical angles are congruent.	Identify if an angle pair is complementary or supplementary.	Given adjacent angles that are complementary and one of the angle measures, find the measure of the missing angle. Limit angle measures to multiples of 5 or 10.	Recognize that the sum of the angles in triangles is 180˚. Given a linear pair and one of the angle measures, find the measure of the missing angle. Limit angle measures to multiples of 5 or 10. Find the measure of a vertical angle when provided the measure of the angle opposite.	Find the missing angle in a triangle, given the two other angle measures. Limit angle measures to multiples of 10.
CCSS.Math.Content.8.G.B.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles.	Identify the right angle of a right triangle.	Identify the parts of a right triangle (e.g. right angle, legs, hypotenuse).	Given a labeled diagram of a right triangle and the Pythagorean Theorem formula, identify the formula that shows correctly substituted leg and hypotenuse values.	Given the length of two legs of a right triangle, find the length of the hypotenuse. Limit to triangles 3-4-5, 6-8-10; 9-12-15; 5-12-13.
CCSS.Math.Content.8.G.B.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	Find the length of each leg of a right triangle graphed on a coordinate plane.	Find the length of a vertical or horizontal line segment on a coordinate plane.	Given a triangle on a coordinate plane and a context, find the distance between two points that share an x- or y-coordinate value.	Given a right triangle on a coordinate plane where one leg is parallel to the x-axis and the other leg is parallel to the y-axis and a context, find the length of each leg.	Given two points on a coordinate plane and a context, find the distance between the two points with different x and y coordinates. Limit to triangles 3-4-5 and 6-8-10.
CCSS.Math.Content.8.G.C.9 Know the formulas for the volumes of cones, cylinders, and spheres, and use them to solve real-world and mathematical problems.	Recognize the relationship between the volume of a cone and a cylinder that have the same height and base area.	Identify prisms, pyramids, cones, spheres, and cylinders.	Match cones and cylinders that have the same height.	Recognize the relationship between the volume of a cone and a cylinder that have the same height and base area.	Find the volume of a cylinder given the area of the base (in terms of pi) and the height. Limit to 2, 5, and 10.
CCSS.Math.Content.8.SP.A.2 Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.	Recognize patterns observed on a scatter plot.	Given a scatter plot, identify associated vocabulary (e.g., outliers, clusters, linear, and association).	Given a scatter plot and the line of best fit, describe the association between the quantities as positive or negative.	Given a scatter plot, determine: (1) linear/nonlinear association (2) outliers	Given a scatter plot, identify the graph that displays the line of best fit.

CCSS.Math.Content.8.SP.A.3 Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr. as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.	Interpret the slope and y-intercept of a linear model when given its graph and a context.	Given the graph of a line and a context, identify the unit rate (e.g., if you earn $8/hour).	Identify the slope and y-intercept of a line given its graph. Limit the display of the function to the first quadrant and linear functions with a slope of 1, 2, 3, 5, and 10.	Given a linear equation and its graph, interpret the slope within a context. Limit to linear equations with positive slopes.	Given a linear equation and its graph, interpret the slope and y-intercept within a context. Limit to linear equations with positive slopes.
CCSS.Math.Content.8.SP.A.4 Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?	Interpret a two-way frequency table.	Identify a specific value in a two-way frequency table.	Solve for a missing value in a two-way frequency table.	Interpret a two-way frequency table by identifying values in the table that describe the association between the two variables (in context).	Construct a two-way frequency table using a given data set.

High School Mathematics

		High School Mathematics Achievement Level Descriptors			
Common Core Standard	Essence Statement	Beginning	Approaching	Meets	Exceeds
CCSS.Math.Content.HS.F.IF.A.1 Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x).	Identify the input and output value of a linear function expressed in function notation.	Given the graph of a line, identify if it is a function.	Given a set of ordered pairs (limit to 3), identify the domain or range.	Identify the input and output value of a linear function expressed in function notation. Limit to functions with no operations.	Given the graph of a linear function y = f(x), identify the table of values that matches the graph of the given function. Table headers should be x and f(x).
CCSS.Math.Content.HS.F.IF.A.2 Using function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.	Evaluate functions.	Evaluate a one-step algebraic expression using substitution. Limit to addition, subtraction, or multiplication. e.g., What is x + 3 when x =2?	Evaluate a two-step algebraic expression using substitution. Limit to addition, subtraction, or multiplication. e.g., What is 2x+3, when x=7?	Evaluate a one-step linear function represented in function notation. Limit to addition, subtraction, or multiplication equations. e.g., Given f(x)=x+3, what is f(2)?	Evaluate a two-step linear function represented in function notation. Limit to addition, subtraction, or multiplication equations.
CCSS.Math.Content.HS.F.IF.B.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.	Interpret key features of a linear function that models the relationship between two quantities.	Identify the slope of a linear function.	Identify the graph of a linear function given its slope and y-intercept.	Identify if a linear function is increasing or decreasing.	Interpret a given linear function based on its real-world context.
CCSS.Math.Content.HS.F.IF.B.5 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.	Identify the domain and range of a function.	Given a table of values, identify the domain.	Given a table of values, identify the range.	Given a graph or table of values, identify the range and domain.	Given a graph that represents a real-world context, identify the domain within context.

CCSS.Math.Content.HS.F.IF.B.6 Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.	Identify the rate of change of a linear function.	Given a table of values that represent a linear function, identify the x values.	Given a table of values that represents a linear function, identify the y values.	Given a table of values that represents a linear function, identify the rate of change.	Given a table of values that represents a linear function for a real-world context, interpret the rate of change within context.
CCSS.Math.Content.HS.F.BF.A.2 Write arithmetic and geometric sequences both recursively and with an explicit formula; use them to model situations; and translate between the two forms.	Differentiate between arithmetic and geometric sequences.	Identify the next term of a set (limit to positive whole numbers) that is increasing in value. Limit to arithmetic sequence.	Identify the next term of a set (including integers) that is increasing in value. Limit to common differences and ratios that are positive whole numbers.	Identify which set of terms are arithmetic or geometric sequences. Limit to common differences and ratios that are positive whole numbers.	Identify terms that precede a given set of terms in the arithmetic or geometric sequence. Limit to identifying 2 preceding terms.
CCSS.Math.Content.HS.F.LE.A.1 Distinguish between situations that can be modeled with linear functions and with exponential functions.	Understand that linear functions increase by equal amounts over equal intervals.	Determine whether a set of points plotted in the coordinate plane or a graph of a function is linear.	Identify the rate of change given a table of values.	Determine whether a given table of values has a constant rate of change.	Given a table of values, determine another x and y value for that function. Term does not have to be the next ordered pair in the set.
CCSS.Math.Content.HS.F.LE.A.2 Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).	Determine output values of a linear relationship given an input value.	Given its coordinates, identify a point on a graph.	Match a table to its equation (limit to y=mx).	Given an input value and a linear relationship, determine the output value.	Create the equation of a line when given a table of values that represent a linear function.
CCSS.Math.Content.HS.F.LE.B.5 Interpret the parameters in a linear or exponential function in terms of a context.	Interpret a linear function.	Identify the slope and y-intercept of a linear function given its graph.	Identify the slope and y-intercept of a linear function given its equation.	Identify what the slope and y-intercept of a linear function represent, given its equation within context.	Identify the linear equation that represents the given context.
CCSS.Math.Content.HS.G.CO.A.1 Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.	Identify undefined terms.	Identify pairs of perpendicular and parallel lines, angles, and circles given visuals.	Distinguish between lines, line segments, and rays given visuals.	Define perpendicular and parallel lines . Given a description of a term, determine if it is a line, line segment, or an angle.	Identify the correct geometric notation of lines, line segments, angles.
CCSS.Math.Content.HS.G.CO.A.3 Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.	Identify whether a rectangle, parallelogram, or regular polygon has been rotated or reflected.	Identify a reflection. Limit to familiar everyday objects.	Identify a rotation. Limit to familiar everyday objects.	Identify the reflections of the rectangle, parallelogram, trapezoid, or regular polygon has been carried upon itself.	Identify the rotations of the rectangle, parallelogram, trapezoid, or regular polygon has carried upon itself.

CCSS.Math.Content.HS.G.CO.B.6 Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.	Identify congruent figures.	Identify congruent line segments after a rigid transformation.	Identify congruent triangles after a rigid transformation.	Identify congruent quadrilaterals after a rigid transformation.	Identify congruent polygons after a rigid transformation.
CCSS.Math.Content.HS.G.CO.C.9 Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.	Solve problems involving theorems about lines and angles.	Find the measure of the supplement or complement of an angle.	Given a pair of intersecting lines that form vertical angles, identify which angles are congruent or which angles are supplementary.	Find the measure of vertical angles and adjacent angles formed by intersecting lines when given one angle measure.	Given a pair of parallel lines and a transversal: (1) Find the measure of alternate interior angles. (2) Find the measure of corresponding angles.
CCSS.Math.Content.HS.G.CO.C.10 Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.	Solve problems involving triangle theorems.	Determine if a triangle is isosceles, equilateral, scalene, acute, right, and/or obtuse.	Given two angles of a triangle, find the measure of the third angle.	Find the base or vertex angle measures of an isosceles triangle. Provide only one base angle when finding the vertex angle.	Given the angle measures of a triangle expressed algebraically, find the angle measures of the triangle.
CCSS.Math.Content.HS.G.CO.C.11 Prove theorems about parallelograms. Theorems include: Opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.	Solve problems involving parallelogram theorems.	Identify which quadrilaterals are parallelograms.	Given a parallelogram and one of its side lengths or angles, identify its opposite side length or angle.	Given a parallelogram and one of its side lengths, identify its opposite side length. Given a parallelogram and one of its angle measures, identify its opposite angle measure.	Given one angle measure of a parallelogram, find the measures of the other three angles. Given the perimeter of the parallelogram and one side, find the lengths of the other three sides.
CCSS.Math.Content.HS.G.SRT.B.5 Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.	Understand the relationship between two congruent triangles. Understand the relationship between two similar triangles.	Identify shapes that have the same number of sides or angles.	Identify congruent triangles.	Determine if two triangles are similar, congruent, or neither.	Determine the missing side lengths and/or angle measures of a congruent or similar rectangle. Limit constant of dilation to 2 for side lengths, given the side length of the smaller rectangle.
CCSS.Math.Content.HS.G.C.A.2 Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles (inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle).	Understand relationships among central angles, radii, and chords and use them to solve problems.	Identify the radius, diameter, or center of the circle.	Identify the diameter of a circle when given the radius. Identify the radius of a circle when given the diameter.	Identify the measure of a central angle or its intercepted arc.	Identify the measure of an inscribed angle or its intercepted arc.

CCSS.Math.Content.HS.G.GPE.B.5 Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).	Understand that the slope of a line can indicate whether two lines are parallel or perpendicular.	Given the graph of two parallel lines and their equations, identify their slope.	Given the graph of two perpendicular lines and their equations, identify their slope.	Given the slope of a line, identify the slope of a line that is parallel or perpendicular to that line.	Given the equations of two lines in slope intercept form, identify if the lines are parallel or perpendicular.
CCSS.Math.Content.HS.G.GPE.B.7 Use coordinates to compute perimeters of polygons and areas of triangles and rectangles (i.e., using the distance formula).	Find the area and perimeter of polygons on a coordinate plane.	Calculate the perimeter of a triangle or quadrilateral.	Calculate the area of right triangles and rectangles.	Find the area and perimeter of a rectangle on a coordinate plane in any quadrant.	Find the area and perimeter of a right triangle on a coordinate plane. Limit to first quadrant.
CCSS.Math.Content.HS.G.GMD.A.3 Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.	Find the volume of three-dimensional figures.	Find the area of a circle (in terms of pi).	Find the volume of cubes and rectangular prisms.	Find the volume of cylinders (in terms of pi) given the area of the base.	Calculate the volume of cones and rectangular pyramids. For cones, the area of the base must be given and in terms of pi.
CCSS.Math.Content.HS.G.GMD.B.4 Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.	Relate two-dimensional figures to three-dimensional figures.	Identify two-dimensional figures.	Identify the polygons that a rectangular prism, triangular prism, or pyramid are composed of.	Identify the cross section of a rectangular prism.	Identify the cross section of triangular prisms and cylinders.
CCSS.Math.Content.HS.G.MG.A.1 Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).	Describe objects in the real world using geometric terminology.	Identify simple geometric shapes.	Apply properties of two-dimensional figures to describe real-life objects.	Compare real-life objects to simple geometric shapes.	Apply properties of geometric shapes to describe real-life objects.
CCSS.Math.Content.HS.A.SSE.A.1a Interpret parts of an expression, such as terms, factors, and coefficients.	Understand and recognize the parts of an algebraic expression.	Identify a variable.	Identify the coefficient of a variable expression.	Given an expression with multiple operations, identify the variables, coefficients, and terms.	Identify an algebraic expression that represents a real-world problem. Limit to one arithmetic operation.
CCSS.Math.Content.HS.A.SSE.A.2 Use the structure of an expression to identify ways to rewrite it. For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.	Interpret the structure of an algebraic expression.	Expand algebraic terms expressed in exponential form. Limit to no coefficients and exponent of 2.	Expand algebraic terms expressed in exponential form. Limit to no coefficients and exponent of 3.	Identify equivalent exponential expressions by applying the product rule. For example, which expression is equivalent to x^8? $(x^3)(x^5)$?	Identify equivalent exponential expressions by applying the power rule. For example, which expression is equivalent to x^8? $(x^4)^2$?
CCSS.Math.Content.HS.A.SSE.B.3 Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.	Identify equivalent algebraic expressions involving the properties of operations.	Match equivalent expressions (limited to commutative property). For example, $2 \times 3 = 3 \times 2$.	Match equivalent expressions (limited to associative property). For example, $(2 \times 3) \times 5 = 2 \times (3 \times 5)$.	Identify equivalent expressions. Limit to the distributive property.	Match given examples of equivalent expressions using factoring (limit to the distributive property. For example, which shows the factored form of $6x + 18$?
CCSS.Math.Content.HS.A.APR.A.1 Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.	Add, subtract, and multiply polynomial expressions.	Combine like terms (limit to terms with one variable). For example, $x+x = 2x$.	Combine like terms (limit to terms with two variables). For example, $2x + 3y + y = 2x + 4y$.	Add, subtract, and multiply polynomials with integer coefficients (limit to linear and up to two term polynomials). Multiplication would only involve expressions involving the distributive property. For example, $3(x + 5)$.	Add and subtract polynomials with integer coefficients. Limit to polynomials with 3 terms.

CCSS.Math.Content.HS.A.CED.A.1 Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.	Use linear equations and inequalities to solve problems.	Solve simple one-step algebraic equations with one variable (addition/ subtraction).	Solve simple one-step algebraic equations with one variable (multiplication).	Solve a one-step problem within context that can be represented by a linear addition/subtraction/ multiplication equation or inequality.	Solve a multi-step problem within context that can be represented by a linear addition/ subtraction equation or inequality.
CCSS.Math.Content.HS.A.CED.A.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	Represent linear equations graphically.	Identify the coordinates of a given point in the first quadrant.	Identify the coordinates of a given point on a coordinate plane (any quadrant).	Identify the linear equation represented by a graph (where the y-intercept is the origin).	Identify the linear Equation represented by a graph (where the y-intercept is not the origin).
CCSS.Math.Content.HS.A.CED.A.3 Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.	Identify viable solutions for a system of linear inequalities.	Identify a solution for a linear equation given its graph on a coordinate plane.	Identify a viable solution for a linear inequality given its graph on a coordinate plane within context.	Identify a viable solution for a linear inequality within context.	Identify a viable solution, within context, for a system of inequalities given their graphs on a coordinate plane.
CCSS.Math.Content.HS.A.REI.A.1 Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.	Given an addition, subtraction, or multiplication equation, identify a step that is needed to solve the equation.	Given a one-step addition or subtraction equation, identify the specific step needed to solve it.	Given a one-step addition, subtraction, multiplication, or division equation, identify the one step needed to solve the equation.	Given a two-step addition, subtraction, multiplication, or division equation, identify the first step needed to solve the equation.	Given a two-step addition, subtraction, multiplication, or division equation, identify all of the steps needed to solve the equation.
CCSS.Math.Content.HS.A.REI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	Solve linear inequalities.	Match a simple inequality with its graph on a number line. (Limit to $x > a$, $x < a$, $x \leq a$, $x \geq a$ where a is an integer between -10 and 10).	Solve one-step addition inequalities and identify the solution on a number line.	Solve one-step addition or subtraction inequalities. For example, $x + 2 > 6$; which value of x makes this true?	Solve linear inequalities with one variable.
CCSS.Math.Content.HS.A.REI.C.5 Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.	Solve a system of linear equations algebraically.	Solve a one-step linear equation.	Solve a one-step linear equation for one variable in terms of another. For example, solve for x: $x + y = 10$.	Solve a system of linear equations where one of the given equations is a constant. For example, solve $x = 3$; $x + y = 10$.	Solve a system of equations in two variables where one of the equations has an isolated variable. For example: $y=2x$; $x+y=9$
CCSS.Math.Content.HS.A.REI.C.6 Solve systems of linear equations exactly and approximately (i.e., with graphs), focusing on pairs of linear equations in two variables.	Solve a system of linear equations graphically.	Identify the coordinates of a point on the line.	Identify the graph of a linear equation.	Identify the coordinates of the solution to the system of linear equations given their graph.	Given the graph of two linear equations with a real-world context, identify the meaning of the point of intersection.
CCSS.Math.Content.HS.A.REI.D.10 Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).	Understand that the solutions to a linear equation are the points that form its graph.	Given a point plotted on the first quadrant, identify its coordinates.	Given the graph of a linear equation, identify the coordinates of a point on the line.	Given the graph of a linear equation, identify which set of ordered pairs is a solution to the given linear equation.	Given a one-step linear inequality, identify its graph on a coordinate plane (where the y-intercept is the origin.)

CCSS.Math.Content.HS.A.REI.D.12 Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.	Represent the solution of a linear inequality on a coordinate plane.	Given a one variable inequality, identify a value that would be a solution.	Identify the graph that represents a one variable inequality (on a number line).	Identify a solution to a one-step linear inequality that is graphed on a coordinate plane.	Given a one-step linear inequality, identify its graph on a coordinate plane (where the y-intercept is the origin).
CCSS.Math.Content.HS.N.RN.A.1 Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. For example, we define $5^{1/3}$ to be the cube root of 5 because we want $(5^{1/3})^3 = 5^{(1/3)^{\wedge}3}$ to hold, so $(5^{1/3})^3$ must equal 5.	Expand algebraic expressions with exponents.	Identify exponents.	Identify equivalent numerical expressions involving whole number exponents up to 2.	Expand an algebraic expression involving whole number exponents. Limit up to double variable algebraic expressions and exponents up to 3.	Identify equivalent exponential expressions. Limit minimum exponent to -2.
CCSS.Math.Content.HS.N.RN.A.2 Rewrite expressions involving radicals and rational exponents using the properties of exponents.	Simplify radical expressions.	Evaluate single-digit squares.	Evaluate single-digit squares and cubes.	Find the square root of perfect squares (up to square root of 100); evaluate expressions that are squared or cubed.	Find the cubic root of perfect cubes (up to cubic root of 125); evaluate expressions that are squared or cubed.
CCSS.Math.Content.HS.N.Q.A.2 Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.	Determine if a graph is correctly labeled.	Identify the x-axis and y-axis of a coordinate plane (first quadrant only).	Match the given values for the tick marks of the x-axis and y-axis labels with their graph (first quadrant only).	Given a context, identify the graph that correctly displays the labels of the x-axis, y-axis, and tick mark values for both axes.	Given a context and a graph of a linear function, determine which set of numbers would be most appropriate to label the x-axis and the y-axis.
CCSS.Math.Content.HS.N.Q.A.3 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	Choose the appropriate units of measure for a given scenario.	Identify the appropriate tools that measure length/distance, volume, mass/weight, or time.	Identify units that measure length/distance, volume, mass/weight, or time.	Given an object that needs to be measured, identify the appropriate units to measure it.	Within context and given the conversion factor, convert inches to feet (or feet to inches), hours to minutes (or minutes to hours), feet to miles (or miles to feet), kilometers to miles (or miles to kilometers), and ounces to pounds (or pounds to ounces).
CCSS.Math.Content.HS.S.ID.A.1 Represent data with plots on the real number line (dot plots, histograms, and box plots).	Represent data using different displays.	Match a given data set to its bar graph.	Match a given data set to its dot plot.	Match a given data set to its histogram or box plot.	Compare a dataset represented in two different forms (limited to histogram, box plot, or bar graph).

CCSS.Math.Content.HS.S.ID.A.2 Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.	Identify the measures of center and spread of two data sets.	Identify the mean and/or median of one given data set. Limit to 5 data points.	Identify the mean, median, and/or range of one given data set.	Identify the mean, median, and/or range of two data sets. Limit to 3 or 5 data points.	Compare the mean, median, and/or range of two data sets. Limit to 4 or 6 data points.
CCSS.Math.Content.HS.S.ID.C.7 Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.	Interpret the slope and the y-intercept of a linear model within context.	Identify the slope and y-intercept of a line given its graph	Identify statements that describe the slope of a line within context.	Identify statements that describe the slope and y-intercept of a line within context.	Identify statements that describe the slope and y-intercept of a linear model (scatterplot) within context.
CCSS.Math.Content.HS.S.CP.B.6 Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model.	Find the probability of an event.	Identify the number of possible outcomes of a simple event (e.g., rolling a die, tossing a coin, etc.).	Find the probability of a simple event (e.g., flipping a fair coin, rolling number cubes, spinners, picking marbles from a bag).	Find the probability of an event given the results of the first event (with replacement). For example, if a person picked a red marble out of a bag of 4 red marbles and 6 blue marbles and replaces it, what is the probability of the person picking a second red marble?	Find the probability of an event given the results of the first event (without replacement). For example, if a person picked a red marble out of a bag of 4 red marbles and 6 blue marbles and does not put it back in the bag, what is the probability of the person picking a second red marble?